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# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
South Florida Ecological Services Office  
1339 20<sup>th</sup> Street  
Vero Beach, Florida 32960

Appendix 2



March 1, 2001

James C. Duck  
Chief, Planning Division  
Jacksonville District Corps of Engineers  
P.O. Box 4970  
Jacksonville, Florida 32232-0019

Service Log No.: 4-1-01-F-400  
Project.: Alternate Test Beach Renourishment  
Dated: July 13, 1999  
Local Sponsor: Miami-Dade County  
County: Miami-Dade

Dear Mr. Duck:

This letter serves to amend the October 24, 1996, Biological Opinion (BO) for the Coast of Florida Study, Region III as it pertains to the project referenced above. This letter is provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

This project has the potential to affect four species of sea turtles. Florida's beaches function as nesting habitat for the federally endangered green (*Chelonia mydas*), endangered leatherback (*Dermochelys coriacea*), endangered hawksbill (*Eretmochelys imbricata*), and threatened loggerhead (*Caretta caretta*) sea turtles. These species are known to nest within the project limits.

The Corps agreed that since project limits fall within the boundaries identified in the Coast of Florida Study, the programmatic BO is applicable. Several revisions to this BO have been completed since 1996 which incorporate new Service guidance on section 7 consultations for sea turtles. The Corps and local sponsor will implement this proposed project consistent with the Coast of Florida Study Biological Opinion, as revised.

The Coast of Florida Study Biological Opinion, and the following four revised sections are relevant to this proposed project:

## Lighting (Terms and Conditions; Number 9)

From March 1 through April 30 and November 1 through November 30, all on-beach lighting associated with the project shall be limited to the immediate area of active construction only and shall be the minimal lighting necessary to comply with safety requirements. Shielded low pressure sodium vapor lights are recommended to minimize illumination of the nesting beach and nearshore waters. Lighting on offshore equipment shall be minimized through reduction, shielding, lowering, and appropriate placement of lights to avoid excessive illumination of the water, while meeting all U.S. Coast Guard and OSHA requirements. Shielded low pressure sodium vapor lights are highly recommended for lights on offshore equipment that cannot be eliminated.

## Incidental Take Statement

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be implemented by the Corps so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Corps must report the progress of the action and its impacts on the species to the Service as specified in the incidental take statement [50 CFR §402.14(I)(3)].

## Amount or Extent of Incidental Take

The Service has reviewed the biological information and other information relevant to this action. Based on this review, incidental take is anticipated for (1) all sea turtle nests that may be constructed and eggs that may be deposited from March 1 through April 30 and from September 1 through September 30 and missed by a nest survey and egg relocation program within the boundaries of the proposed project; (2) all sea turtle nests deposited from October 1 through February 28 (or 29 as applicable) when a nest survey and egg relocation program is not required to be in place within the boundaries of the proposed project; (3) harassment in the form of disturbing or interfering with female turtles attempting to nest within the construction area or on adjacent beaches as a result of construction activities; (4) disorientation of hatchling turtles on beaches adjacent to the construction area as they emerge from the nest and crawl to the water as a result of project lighting; (5) behavior modification of nesting females due to escarpment formation within the project area during a nesting season, resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs; (6) all nests destroyed as a result of escarpment leveling within a nesting season when such leveling has been approved by the Fish and Wildlife Service; and (7) reduced hatching success due to egg mortality during relocation and adverse conditions at the relocation site.

Incidental take is anticipated for only the 1.5 miles of beach that have been identified for sand placement. The Service anticipates incidental take of sea turtles will be difficult to detect for the following reasons: (1) the turtles nest primarily at night and all nests are not found because [a] natural factors, such as rainfall, wind, and tides may obscure crawls and [b] human-caused factors, such as pedestrian and vehicular traffic, may obscure crawls, and result in nests being destroyed because they were missed during a nesting survey and egg relocation program; (2) the total number of hatchlings per undiscovered nest is unknown; (3) the reduction in percent hatching and emerging success per relocated nest over the natural nest site is unknown; (4) an unknown number of females may avoid the project beach and be forced to nest in a less than optimal area; (5) lights may disorient an unknown number of hatchlings and cause death; and (6) escarpments may form and cause an unknown number of females from accessing a suitable nesting site. However, the level of take of these species can be anticipated by the disturbance and renourishment of suitable turtle nesting beach habitat because: (1) turtles nest within the project site; (2) beach renourishment will likely occur during a portion of the nesting season; (3) the renourishment project will modify the incubation substrate, beach slope, and sand compaction; and (4) artificial lighting will disorient nesting females and hatchlings.

## Terms and Conditions Summation Paragraph

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. The amount or extent of incidental take for sea turtles will be considered exceeded if the project results in more than a one-time placement of sand on the 1.5 miles of beach proposed for nourishment. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Consultation under section 7 of the ESA should continue as upland sand specifications, sand source alternatives, and sand transport details are evaluated. It may be necessary to initiate consultation for additional species, depending on development of these plans.

Thank you for your cooperation in the effort to protect threatened and endangered sea turtles and their nesting habitat. We are available to meet with agency representatives and the applicant to resolve outstanding resource issues associated with this project. If you have any questions, please contact Trish Adams at (561) 562-3909 extension 232.

Sincerely yours,

James J. Slack  
Field Supervisor  
South Florida Ecological Services Office

cc:  
Service, Jacksonville, Florida (Sandy MacPherson)



JUL 20 2000

UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office  
9721 Executive Center Drive North  
St. Petersburg, Florida 33702

July 14, 2000

James Slack  
U.S. Department of the Interior  
Fish and Wildlife Service  
South Florida Ecosystem Office  
P.O. Box 2676  
Vero Beach, Florida 32961-2676

Dear Mr. Slack:

The National Marine Fisheries Service (NMFS) has reviewed the draft Fish and Wildlife Coordination Act Report (CAR) dated June 20, 2000, on the Dade County Beach Erosion Control and Hurricane Protection Project. The proposed project involves placing sand fill along approximately 1.5 miles of shoreline near 63<sup>rd</sup> Street in Miami Beach, Dade County, Florida.

The draft CAR indicates the proposed project will extend over approximately 1.5 miles of shoreline, located between DEP monuments R-36 and R-47, and involves 600,000 cubic yards of fill material. According to the document, the ocean bottom along the length of the proposed project is composed of barren sand. Reef maps from the Corps of Engineers' 1996 Coast of Florida Erosion and Storm Effects Study, Region III (Coast of Florida Study) indicates that the nearest hard bottom reefs are located approximately 1/4 mile offshore. The draft CAR also indicates that the original scope of work called for using non-domestic sand material, but that this was changed to an unidentified domestic upland source at the request of the U.S. Fish and Wildlife Service (FWS). Therefore, the FWS has made the determination that because the project does not involve dredging of offshore areas, the effects on fish and wildlife resources along the project area should be insignificant.

The NMFS agrees that impacts to marine resources normally associated with dredging within borrow areas will be eliminated with this project. However, the NMFS recommends that a benthic survey of the nearshore area near the beach fill should be conducted to insure that no hard bottom habitat will be affected. The benthic maps used in the Coast of Florida Study are over 4-years old and may not reflect the current hard bottom reef locations and topographies. In addition, we agree with the FWS' recommendation that the sand specification information, along with soil chemical analysis, should be provided for review. The NMFS has some concerns that should the sand material be inconsistent with beach quality standards, siltation and turbidity plumes may impact nearshore hard bottom habitat. These areas are Essential Fish Habitat (EFH), as defined by 1996 amendment to the Magnuson-Stevens Fishery Conservation and Management Act and could be adversely affected by the proposed project. The South Atlantic Fishery Management Council (SAFMC) has identified EFH in the project area for species they manage including shrimp, the snapper-grouper complex (containing ten families and 73 species), Spanish and king mackerel, coral, and coral reef communities, and spiny lobster. The NMFS has identified EFH for highly migratory species that include billfishes and species of sharks that inhabit this area, such as nurse, blacktip, sandbar, lemon, and bull sharks. Likewise, the Mid Atlantic Fishery Management Council has identified EFH for bluefish that includes pelagic waters in the project area from the coastline to well beyond the construction limits for this project. Various life stages of some managed species found in the project area include larvae, postlarvae, juvenile and adult stages of red, gray, lane, schoolmaster, mutton and yellowtail snappers, scamp, speckled hind, red, yellowedge and gag groupers, Spanish and king mackerel, bluefish, white grunt, and spiny lobster.





Categories of EFH that may occur within the project area include marine water column (including pelagic waters), live/hard bottoms, coral, coral reefs, and artificial/manmade reefs. The SAFMC also has identified EFH Habitat Areas of Particular Concern (HAPC) within the project area. HAPCs are subsets of EFH that are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Offshore areas of high habitat value or vertical relief and habitats used for migration, spawning, and rearing of fish and shellfish have been included within HAPC. Specifically, categories of HAPC in the vicinity of the proposed project include hermatypic coral habitat and reefs and hard bottom habitats.

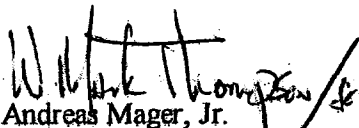
In addition to EFH for Federally managed species, hard bottom, coral, and shallow nearshore habitats provide nursery, foraging, and refuge habitat for other commercially and recreationally important fish and shellfish. Species such as blue crab, shrimp, flounder, red drum, pompano, snook, striped mullet, tarpon, and a variety of reef fish and tropical fish are among the many species that utilize this habitat.

The nearshore hard bottom reefs serve as settlement habitats for immigrating larvae of fish and invertebrates or as intermediate nursery habitats for juveniles emigrating out of nearby inlets (Vare 1991; Lindeman and Snyder 1999). At least eighty-six taxa of fish have been quantified among nearshore hard bottom habitats along southeast mainland Florida, including at least 34 species of juvenile reef fish which may utilize these habitats as nursery areas (Lindeman and Snyder 1999). Gilmore and Herrema (1981) recorded 107 species of fish from the littoral and sublittoral surf zone reef of central-east Florida. Peters (1984) found that in samples taken from the surf zones near Sebastian Inlet, a significantly higher abundance and diversity of fish were found adjacent to nearshore hard bottom habitats.

In addition, green, hawksbill, leatherback, and loggerhead sea turtles are all known to utilize Dade County beach and nearshore habitats for nesting, foraging, and resting, and are protected by the NMFS and U.S. Fish and Wildlife Service under the Endangered Species Act of 1973. Environmental assessments completed for past beach renourishment projects have limited their discussion of sea turtles to the impacts on nesting habitat (USACE 1987, 1994, & 1996). However, several studies have determined that nearshore hard bottom habitats are important nursery area for juvenile green turtles and loggerheads (Wershoven 1987; Wershoven and Wershoven 1989; Guseman and Ehrhart 1990; Wershoven 1992). Because this proposed project may impact endangered sea turtles, copies of the final CAR should be forwarded to our Protected Resources Division at the letterhead address above.

We appreciate the opportunity to provide these comments. If we can be of further assistance, please advise. Related comments, questions or correspondence should be directed to Mr. Michael R. Johnson in Miami, Florida, at 305-595-8352.

Sincerely,

  
Andreas Mager, Jr.  
Assistant Regional Administrator  
Habitat Conservation Division

cc:  
F/SER4  
F/SER3  
F/SER43-Johnson

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# FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

Appendix 4



JAMES L. "JAMIE" ADAMS, JR.  
Bushnell

BARBARA C. BARSH  
Jacksonville

QUINTON L. HEDGEPEETH, DDS  
Miami

H.A. "HERKY" HUFFMAN  
Deltona

DAVID K. MEEHAN  
St. Petersburg

JULIE K. MORRIS  
Sarasota

TONY MOSS  
Miami

EDWIN P. ROBERTS, DC  
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Jacksonville

ALLAN L. EGBERT, Ph.D., Executive Director  
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OFFICE OF ENVIRONMENTAL SERVICES  
255 154<sup>th</sup> Avenue  
Vero Beach, FL 3296  
(561) 778-5094 SunCoast 240-509  
FAX (561) 778-7227 SunCoast 240-722

May 30, 2000

Mr. James J. Slack  
Project Leader  
South Florida Field Office  
U.S. Fish and Wildlife Service  
P.O. Box 2676  
Vero Beach, Florida 32961-2676

Re: Dade County Beach Erosion Control and  
Hurricane Protection Project, Dade County

Dear Mr. Slack:

The Office of Environmental Services of the Florida Fish and Wildlife Conservation Commission has reviewed the referenced report. We concur with the U.S. Fish and Wildlife Service's conclusions and recommendations regarding this project.

Sincerely,

A handwritten signature in black ink, appearing to read "Stephen R. Lau".

Stephen R. Lau  
Biological Administrator

ENV 1-4-2

SRL/js

## **BEACH FILL**

### **1. PAYMENT**

Payment for sand fill shall be made on the basis of the quantity of sand placed within each Acceptance Section, as measured by the volume of sand within the template shown on the plans. The total quantity may be modified depending on the Mean Grain Size of the sand delivered, according to these specifications and the Bid Schedule. During placement and prior to measurement, the fill sand must have been flooded to consolidate the sand, according to these specifications. Acceptance Sections will not be accepted by the Government until all Mean Grain Size analysis and calculations has been completed for that Acceptance Section, verifying the Mean Grain Size of sand delivered, and thus the proper quantity of sand for that Mean Grain Size, as shown on the Bid Schedule.

### **2. ACCEPTANCE SECTIONS**

Acceptance Sections shall be every 500 feet along the project beach.

### **3. SAND SOURCE**

This project is a test fill for a generic upland source of sand. No offshore sand sources shall be an acceptable source.

### **4. SAND FILL MATERIAL**

The Contractor is responsible for providing a source, delivery and spreading of beach compatible sand that meet the following specifications. The sand supplied shall be naturally created. The sand may be processed, but manufactured sand is not allowed. Contractor's offering blended sand shall submit a Blending Plan, showing the method the sand components will be thoroughly mixed before final placement on the beach. The project requires the contractor to Bid sand with an average mean grain size of 0.30 mm or greater. The sand will be placed and shaped on the beach to fill the construction template shown in the plans, except as modified by the Mean Grain Size. Final beach fill shape shall parallel the construction template shown in the plans.

The project will benefit from placement of coarser sand, and incentive is provided to bid the coarsest sand available. The incentive is in two parts:

- 1) The project design beach must be built to the template shown on the plans. A price incentive for an increased Average Mean Grain Size is offered for that portion of the fill quantity (52 percent of the total quantity).
- 2) For the advance nourishment portion of the project fill (48 percent of the total quantity), a reduced quantity incentive for an increased Average Mean Grain Size is offered.

If the contractor can provide sand with an Average Mean Grain Size of 0.33mm or coarser, the corresponding Bid and placed quantity will be reduced. Placed volume reduction for coarser sand is available on the Bid Schedule, up to a maximum allowable Mean Grain Size of 0.55 mm. The contractor should select the largest (coarsest) Mean Grain Size he can provide. **The contractor is warned that failure to achieve the grain size class selected on the Bid Schedule, by delivering a finer Mean Grain Size sand, will increase the quantity of sand required for delivery to the project.**

Correspondingly, a coarser sand delivered than selected on the Bid Schedule will reduce the volume of sand required. The price incentives shall be paid after determining the Average Mean Grain Size of the completed Acceptance Section. Table 1 shows the coarse sand price and quantity incentives.

**TABLE 1  
COARSE SAND INCENTIVES**

MEAN GRAIN SIZE (mm)	DESIGN BEACH		ADVANCE NOURISHMENT		TOTAL QUANTITY CY
	52% OF TOTAL QUANTITY	% PRICE INCREASE	48% OF TOTAL QUANTITY	% VOLUME REDUCTION	
0.30	208,000	0%	192,000	0%	400,000
0.33	208,000	2%	159,360	17%	367,360
0.36	208,000	5%	140,160	27%	348,160
0.40	208,000	8%	126,720	34%	334,720
0.45	208,000	10%	119,040	38%	327,040
0.50	208,000	15%	115,200	40%	323,200
0.55	208,000	19%	113,280	41%	321,280

## 5. CHARACTER OF MATERIAL

The character of the sand to be supplied by the Contractor shall meet the following physical specifications:

- Composed of quartz and/or carbonate with no more than 20 percent *sand of other mineralogical composition.*
- *The carbonate sand grains allowable under this specification are naturally occurring, durable and solid carbonate grains. Many carbonate grains have excessive internal pore space dramatically reducing the grains density and durability. Carbonate grains*

*delivered under this specification shall be 90 percent durable and solid carbonate grains. Internal pore space shall not exceed 10 percent*

*Whole and broken mollusk shells from the beach environment are durable and solid carbonate grains. Due to the platy nature of shells and shell fragments, no more than 60% of the sand (quartz or carbonate) shall be whole or broken shell.*

- Silt content (passing #200 sieve (.074mm)) of less than 5%.
- 99% of material must pass 3/8 inch sieve and shall contain no material larger than the 3/4 inch sieve.
- Average mean grain size greater than or equal to 0.30 mm and less than 0.55 mm.
- Phi Standard Deviation values from 0.50 phi to **1.75 phi**.
- Free of debris, sharp rocks and pebbles, concrete rubble, clay, and organic material.
- Sand color shall be similar to the existing beach. Based on the Munsell Soil Color Chart, color must be within the range:  
HUE of: 2.5 YR, 5 YR, 7.5 YR, 10 YR, 2.5 Y, 5 Y  
CHROMA of: 1, 2, or 3  
VALUE of: 6, 7, or 8.  
This color specification eliminates strongly colored or dark sand.

## **6. SUBMITTALS**

Sand source information that shall be submitted with the proposal is:

- 1) the name, location and physical address of the proposed sand source;
- 2) written evidence that the proposed sand source is permitted under local, State, and other authorities, as applicable;
- 3) a grain size distribution of the proposed sand source as determined and reported by a Certified Testing Laboratory. The grain size data shall supply all information required for grain size distribution data under GRAIN SIZE REPORTING requirements.
- 4) a 1 to 3 pound sample of the proposed fill material; and
- 5) evidence that the proposed sand source contains sufficient quantity of acceptable material for the construction of the work.

Samples shall be provided in sealed plastic containers, either jars or bags, clearly marked with the name of the Contractor, the name of the source and any other identifying information.

**The submitted grain size distribution data and the sample of the proposed sand source (including its color and texture) shall be representative of the typical nature of the entirety of the proposed sand fill. The Government will retain the submitted documents and samples.**

## **7. SAND FLOODING**

If the sand is placed in a state that is not completely saturated by hydraulic placement, the Contractor must saturate the dry placed sand to effect consolidation equal to hydraulic placement. No more than 100 cubic yards of sand at a time shall be placed on the beach without saturating. Enough water must be used to completely saturate the sand, not less than 100 gallons of water shall be available for each cubic yard of sand placement. Run off water shall be controlled so as not to run off the project limits on the upland side and not to run directly to the ocean forming gullies, eroding the fill sand.

## **8. CALCULATION OF AVERAGE MEAN GRAIN SIZE**

The Mean Grain Size and Phi Standard Deviation shall be determined by Method of Moments Statistics calculated from sieve analysis of the proposed sand source. A Certified Testing Laboratory shall perform laboratory testing in accordance with ASTM – D422. The Method of Moments Statistics shall be calculated according to the instructions contained within this section.

Mean grain size and phi standard deviation are statistical measures of the textural character of a sample of sand, corresponding to the mean and standard deviation of a statistically normal population (example: sand grain sizes). Laboratory sieving of sand provides the data for calculation of the mean grain size and phi standard deviation. There are several methods of calculating these statistics. For the purposes of this contract, Mean Grain Size and Phi Standard Deviation shall be calculated by the Method of Moments. The method of calculation is included in this section. The Average Mean Grain Size refers to the average of the Mean Grain Sizes calculated for individual samples sieved in the laboratory. The Average Mean Grain Size shall be used to evaluate price and quantity incentives for this contract.

## **9. GRAIN SIZE REPORTING**

The grain size distribution information shall be based upon ASTM – D422, using U.S. Standard sieve sizes 3/8", 4, 8, 16, 30, 40, 50, 70, 100, 140, 200, 230. All gradation curves shall be submitted on ENG Form 2087, sample appended to this section. All title information shall be filled out with project name, date, sample number, location sample obtained, unified soil classification, percent silt passing the No. 200 sieve (0.074mm), percent silt passing the No. 230 sieve (0.063mm) and Method of Moments Mean Grain Size and Phi Standard Deviation. Each curve shall state what Mean Grain Size class the sample meets, according to the Bid Schedule. A tabulation of the laboratory results of the cumulative percent retained on each sieve by weight shall be provided with each

gradation curve. Samples from the sand source shall be numbered consecutively. Samples from the project site shall be identified with the Acceptance Section, numbered consecutively for each Acceptance section, and a station and range location.

## 10. CERTIFIED TESTING LABORATORY

Certified Testing Laboratory refers to a geotechnical testing laboratory qualified under ASTM E329-95c standards and certified by AASHTO (American Association of State Highway and Transportation Officials) National Voluntary Accreditation Program; or MMRL (AASHTO Materials Reference Laboratory accreditation; and personnel qualified by NICET (National Institute for Certification of Engineering Technicians).

## 11. MEAN GRAIN SIZE AND PHI STANDARD DEVIATION CALCULATION USING THE MOMENT METHOD

The equations for calculating the Mean Grain Size and Phi Standard Deviation using the moment method are as follows:

$$\text{Mean Grain Size } M = \frac{\sum fx}{n}$$

$$\text{Phi Standard Deviation } \sigma = \sqrt{\frac{\sum (x - M)^2}{n}}$$

Use of these equations to calculate the moment method values is illustrated in Table 2. Column A is the sieve size used, Column B is the corresponding sieve opening in millimeters, and Column C is the sieve opening in phi. The phi values are used in the calculation.

Sieve analysis measures the percent retained on each sieve size by weight (Column D). Column E (x) is the midpoint value in phi between adjacent sieves. Column F (f) is the percent retained by the smaller of adjacent sieves. Column G is the product of Column E and F (x \* f). The sum of the values in Column F is n, sum of the percent retained on the smallest sieve used. This value will generally be less than 100%, as some fine material passes through all the screens. The sum of the values in Column G is  $\sum fx$ , and its division by n produces the mean grain size in phi units of measure. The millimeter (mm) value is calculated as follows:

$$2^{-\phi} = \text{mm}$$

$$\text{Example: } 2^{-1.25 \phi} = 0.42 \text{ mm}$$

Columns H and J are used to calculate the Phi Standard Deviation ( $\sigma$ ) value of the material. If a sieve size is not used in the testing process it should be completely eliminated from the calculation table.

## 12. QUALITY CONTROL SAMPLING

The Contractor shall perform sampling that includes no less sample collection than described in the following plan. The Contractor shall conduct all testing in a location



accessible to government inspectors. The Contractor shall include the sampling and testing procedure in his Contractor's Quality Control Plan for government review and acceptance within ten days of notification of acceptance of Bid. The Quality Control Plan shall include the name, address and point of contact for the Certified Testing Laboratory to be used for all grain size analysis. The location of the testing facility to be used for this contract shall also be included in the Quality Control Plan. Gradation test results shall be turned in daily with the daily quality control reports. Each sample collected shall be approximately one pound in weight and obtained from a single location. All laboratory test results shall be reported to the Government.

### Sampling at the Sand Source

Sand samples for laboratory testing shall be collected at the sand source at the rate of one sample for every 2000 cubic yards of sand to be transported. Sampling and testing shall be completed before the sand is transported to the project site, and shall be representative

Table 2								
CALCULATION OF MOMENT METHOD FOR MEAN GRAIN SIZE AND PHI STANDARD DEVIATION								
A	B	C	D	E	F	G	H	I
U.S.	GRAIN SIZE		CUMULATIVE	* Cumulative Percent Retained is example results of laboratory sieving of a sand sample.				
STANDARD SIEVE	mm	PHI	PERCENT RETAINED*					
3/4	19.00	-4.25	0.0%	-3.75	0.9%	-0.034	28.084	0.253
3/8	9.51	-3.25	0.9%	-2.75	3.8%	-0.105	18.498	0.703
4	4.76	-2.25	4.7%	-1.75	4.7%	-0.082	10.901	0.512
8	2.38	-1.25	9.4%	-0.75	9.5%	-0.071	5.298	0.503
16	1.19	-0.25	18.9%	0.25	10.5%	0.026	1.694	0.178
30	0.595	0.75	29.4%	1.00	4.5%	0.045	0.303	0.014
40	0.420	1.25	33.9%	1.50	5.3%	0.080	0.002	0.000
50	0.297	1.75	39.2%	2.00	9.0%	0.180	0.203	0.018
70	0.210	2.25	48.2%	2.50	12.3%	0.307	0.899	0.111

100	0.149	2.75	60.5%	3.00	24.8%	0.744	2.098	0.520
140	0.105	3.25	85.3%	3.50	10.6%	0.371	3.815	0.404
200	0.074	3.76	95.9%	3.88	1.1%	0.043	5.417	0.060
230	0.063	4.00	97.0%					
SUM				n=	97.0%			
SUM				Σ=		1.50		3.276
MEAN GRAIN SIZE (PHI)				M(phi) =		1.55		
MEAN GRAIN SIZE (mm)				M(mm) =		0.34		
PHI STANDARD DEVIATION				σ=				1.84

of the sand being delivered to the project. Each day's samples Mean Grain Size and Phi Standard Deviation shall be averaged and the running average recorded on the gradation curve, along with the individual sample Mean Grain Size and Phi Standard Deviation. A new average shall be started each day. The Average Daily Mean Grain Size shall be used as an indicator for the Mean Grain Size for the sand proposed on the Bid Schedule and being delivered to the project. No individual sample Mean Grain Size shall be less than 0.25 mm. Any materials not meeting the Mean Grain Size requirements shall not be transported to the project site. Any materials not meeting the Contractor's Bid Mean Grain Size delivered to the project site shall fall into the lower Mean Grain Size class, and appropriately more sand shall be delivered.

### Sampling at the Project Site

Sand samples for laboratory testing shall be collected at the project site. Sand samples shall represent the fill material only, avoiding existing beach sand below the project fill. Sand samples shall be collected from each beach fill Acceptance Section. Sand samples shall be collected at the rate of one sample representing 500 cubic yards of sand delivered. This represents approximately 100 samples taken per 500 foot Acceptance Section. The samples shall be collected on a regular sampling grid covering the entire Acceptance Section, and the location recorded on the gradation curve. The plan of beach sampling shall be submitted with the Contractor's Quality Control Plan. All sample collection in an Acceptance Section shall be distributed temporally over the entire filling operation. Half of the samples shall be collected during filling of the Acceptance Section, when the fill is approximately less than half of the final grade. The second half of the samples shall be taken from the surface of the completed Acceptance Section. Samples shall not be collected from the surface, but 6 inches below the ground surface. Before an Acceptance Section is surveyed for final payment and accepted by the government, all sample laboratory analyses shall be completed and submitted to the Government. All individual sample Mean Grain Size and Phi Standard Deviation shall be tabulated. The tabulation shall include sample identifying information including Acceptance Section, sample number and date. The Average Mean Grain Size and

Average Phi Standard Deviation for each Acceptance Section shall be calculated from and indicated on the tabulation sheet. The Average Mean Grain Size from the sample analysis for each Acceptance Section shall be compared to the Bid Schedule Mean Grain Size class, and verify that the appropriate quantity of sand has been delivered for the Mean Grain Size of the sand in that Acceptance Section. The survey of the Acceptance Section will verify the quantity of sand delivered. **The total quantity of sand in an Acceptance Section shall match the quantity shown on the Bid Schedule for the Mean Grain Size class of sand indicated by the Average Mean Grain Size of sand delivered to that Acceptance Section.**

### **13. PERMITS**

The Contractor shall be responsible for obtaining all applicable permits for the sand source. As part of the proposal, the contractor shall submit evidence satisfactory to the Government that the sand source to be used for the project is permitted by local, State, and Federal authorities, as applicable. The Contractor is likewise responsible for obtaining all applicable permits and licenses for the transport of equipment and material undertaken as part of the work.

The Government shall obtain permits for the placement of the fill sand along the project beach area. By acceptance of the contract, the Contractor agrees to abide by all applicable conditions of the permits.

### **14. ENVIRONMENTAL QUALIFICATIONS**

#### **GENERAL REQUIREMENTS FOR BORROW SOURCES**

It is important that any material to be used for a Dade Co. sand borrow source be considered to be as clean as what exists on Dade beaches or is normally used for playground quality sand. A Phase I HTRW (Hazardous Toxic and Radioactive Waste) Evaluation to meet the requirements of ASTM E-1527-97 shall be performed on the borrow source material. If the borrow site contains HTRW materials or is suspected of containing hazardous materials, fissionable materials, environmental contaminants or otherwise toxic materials it shall not be used as a borrow source. Materials passing these evaluation criteria will be tested as provided below and testing results provided to the Government.

#### **REQUIREMENTS FOR RADIOACTIVE ISOTOPES:**

Radiation levels and radioactivity content shall be measured for the borrow material and for beach area. The borrow area and the beach placement area shall be surveyed in a pattern approved by the Government as described below. The background radioactivity and radiation levels (milli-roentgens/hour) of the borrow area vs. the beach site shall be compared. The levels of contaminant (radioactivity content in pico-curies/gram) in borrow material cannot exceed the mean levels existing at the beach placement area. If

radioactivity levels of the source material exceed the mean naturally occurring radiation levels at the beach area, the site shall not be used as a borrow source. These radiological surveys and analysis shall consist of the following:

Radiation surveys are to be taken at the beach and borrow sites. The radiation levels shall be presented in graphical and tabular form. These surveys shall be taken at waist level. Additionally, samples from the beach and borrow site shall be analyzed for radioactivity levels and be reported in pico-curies per gram. The measurements shall also fall within 1 standard deviation or suspect high values will be determined to be the most conservative representation of the results. The results of the radioactivity (pico-curies per gram) shall be reported in graphical and tabular form.

The resulting beach background radiation level shall not be increased by more than 20 micro-roentgens/hr. This is to be determined by gamma radiation surveys (with the probe at waist level) taken both before and after the beach material placement.

Gamma spectroscopy analysis for Radium 226 shall be performed at the beach site and at the potential borrow site. The placement of borrow material shall not allow the resulting composite radioactivity at the beach (determined by the gamma spectroscopy) to increase by more than 5 pico-curies/gram.

Methodology for radioactivity content to be used for individual sample analysis shall be EPA method 9310 for alpha and beta emissions.

Methodology for Gamma Spectroscopy analysis shall be EPA method-----

The Contractor shall provide reports to the Government demonstrating their evaluation of the above criteria and provide all data including all radiation values taken.

## **REQUIREMENTS FOR ENVIRONMENTAL CONTAMINANTS**

The Contractor shall provide reports to the Government demonstrating their evaluation of the below criteria and provide all data including all chemical values determined. The data shall be provided in graphical and tabular format. It is anticipated that background level of contaminants for Dade County beaches is essentially zero or below detection limits. Should contaminants be detected in borrow material the levels of contaminant in borrow material cannot exceed the mean levels existing at the beach placement area in samples taken as described below. These measurements will consist of the following chemical testing of the borrow material and elutriates;

Total Recoverable Petroleum Hydrocarbons (TRPH), EPA 9071A or EPA 8440

Heavy metals (As, Ba, Cd, Cr, Hg, Pb, Se), EPA method 3051 (Use graphite furnace method for each metal except Hg which has own method)

Volatile Halogenated Organics (Cl-, Br-), EPA method 8021A

Polycyclic Aromatic Hydrocarbons (BTEX), EPA method 8021A

Elutriate Preparation shall be by the method provided in EPA/CE 81-1. Testing for all above contaminants shall be performed on elutriates.

If contaminant levels of the borrow material exceed the mean naturally occurring contaminant levels at the beach area, the site shall not be used as a borrow source. The measurements shall also fall within 2 standard deviation or suspect high values will be determined to be the most conservative representation of the results. Elutriate values shall be compared to State Water quality standards to determine whether runoff will violate State standards.

### **SAMPLING LOCATIONS FOR ENVIRONMENTAL CONTAMINANTS**

Samples to be taken for the above requirements shall be taken every 1000 feet as needed in the beach placement area, for representative beach quality samples, and in spots considered to be representative of every 50,000 cubic yards of the borrow material. Representative samples from all sites shall be taken in a pattern and locations approved by the Corps.

APPENDED TO SECTION:

.....GRADATION CURVE, ENG FORM 2087

